Alaris® System with the Alaris Pump module

Priming

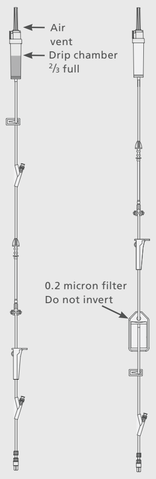
Prepare the set:

1. Close roller clamp.
2. Spike and hang fluid container.

   Note: Position primary container above top of Alaris Pump module. If possible, adjust IV pole so top of fluid in primary container is approximately 20" above top of Alaris Pump module. If it is lower, flow will slow slightly.
3. Fill drip chamber ⅔ full.
4. Open roller clamp, and slowly prime tubing. Priming slowly helps minimize turbulence that can cause air bubbles to form.
5. Close roller clamp when priming is complete.

Notes:

- Ensure vent is closed whenever spiking a new bottle. If vent is open, fluid could wet the vent and in effect, flow will slow or block and air bubbles may form in tubing.
- After priming drip chamber, open vent cap.
- Use a syringe to aspirate air from SmartSite® needle-free valves, if desired.
- When priming a set with a filter, do not invert filter.
- Maintain filter at or below level of vascular access site device while connected to patient.



Set loading

1
Prime set, close roller clamp

2a
Hold upper fitment above fitment recess and lower into recess
Warning: Do not push or snap upper fitment snugly into upper recess

2b

2c

3
Grooves in fitment should fit square in upper fitment tubing retainer

4
Ensure tubing is not twisted, press safety clamp fitment into recess

5
Firmly push tubing toward back of air-in-line detector

6
Do not touch, stretch or flick pumping segment

7
Gently close module door with one hand, grasp top of module while lowering hatch with other hand

8
Open roller clamp and verify that no fluid is flowing through drip chamber

9
Confirm loaded upper fitment

Examples of *improper* loading

Note: Unregulated flow or over-infusion may result if door is not fully closed.

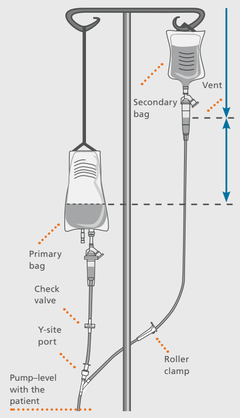
Secondary setup

Note: Primary tubing must contain a check valve.

1. Prepare secondary container—close roller clamp on secondary tubing, and spike secondary container.
2. Swab top of Y-site port on primary tubing with appropriate antiseptic, and attach secondary line to the port.
3. Hang primed secondary container from IV pole.
4. Hang primary container **LOWER** using hanger(s) provided in secondary set.

   Note: Accurate secondary infusion delivery depends hanging secondary container sufficiently higher than primary container.
5. Open vent on the drip chamber if secondary container is glass or semi-rigid.
6. Open roller clamp on secondary set.
7. Program secondary infusion. After infusion starts, ensure that drops fall in secondary drip chamber and not in primary drip chamber.

   Note: If drops are seen in primary drip chamber, lower primary fluid on another hanger.



Accurate Secondary mode infusion depends on hanging secondary container sufficiently higher than primary container.

Secondary bottles may need to be higher than secondary bags.

Helpful hints:

- Factors such as size of secondary container, restrictions in flow path and rate of delivery of secondary fluid can influence infusion duration.
- Secondary fluid containers such as 50 mL or 100 mL "mini-bags" that are usually delivered at lower flow rates typically require only one hanger.
- If secondary container is large or secondary flow rate is high, perform a simple test to ensure that no unwanted primary flow will occur during the secondary infusion:
  - Start secondary infusion.
  - Note level of bottom of secondary container. By hand, lower secondary container so top of it is where it will be when the bag empties.
  - Watch for drops in primary drip chamber.
  - If drops are seen, lower primary fluid on another hanger.

Set removal

1. Close roller clamp.
2. Open pump module door.

   Note: When door is opened, administration set safety clamp fitment will automatically close to help prevent accidental free-flow.
3. Gently pull tubing below air-in-line (AIL) detector forward and out.
4. Lift upper fitment from upper fitment recess.

   Note: Safety clamp fitment is closed *(white clamp is extended)* when removed from pump. When reloading administration set into pump, leave white clamp on safety clamp fitment closed *(extended)*, then follow set loading steps.

Reduce air-in-line alarms

1. Do not stretch tubing *(especially pump segment in blue sheath)* when removing IV tubing from package and inserting into Alaris Pump module.
2. Gently squeeze drip chamber to ⅔ full and hang vertically.
3. **Slowly** prime to avoid turbulence.
4. When inserting the tubing into AIL detector, use a fingertip to firmly push tubing toward back of AIL detector *(Figure 4)*.
5. If possible, allow solutions to warm to room temperature. Infusing a chilled solution may cause air bubbles to form as cold solutions begin to warm.
6. Keep Alaris System level with or slightly lower than patient to maintain positive pressure.
7. Pause channel before replacing a fluid container to prevent air from entering IV tubing.
8. Clean AIL detector as needed using a cotton swab moistened with water.
9. If device continues to alarm for AIL, label module and send it to biomedical engineering.

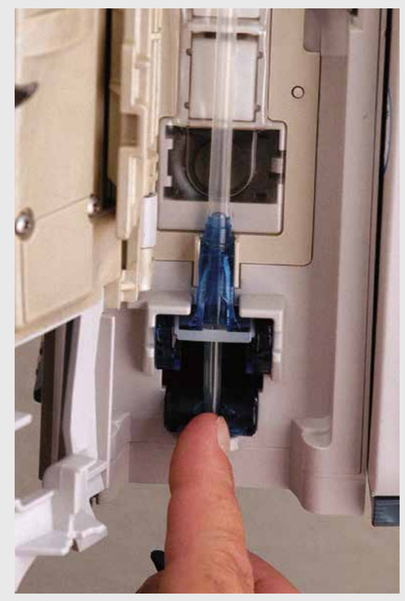


Figure 4

Restore feature

The Restore feature can be utilized in several different ways:

- When programming VTBI reaches 0 and Alaris Pump module scrolls **INFUSION COMPETE—KVO**, the same VTBI re-establishes when Channel Select is pressed. The previously entered VTBI for the subsequent infusion reappears when Restore is pressed on the main display screen.
- When any Alaris Pump module is powered off and relocated but not disassociated from the originally programmed Alaris PC unit, all previously entered programming values appear when Channel Select and then Restore are pressed on the main display.
- When any Alaris Pump module is powered off and not relocated on the originally programmed Alaris PC unit, all previously entered programming values appear when Channel Select and then Restore are pressed on the main display.
- When the entire Alaris System is powered off and powered on within eight hours *(select **NO** to New Patient)* and any Alaris Pump module is not disassociated from the originally programmed Alaris PC unit, all previously entered programming values appear when Channel Select and Restore are pressed on the main display.

Delay Start Options with Delay Start Callback

What is the Delay Start Option feature?

The Delay Start Option allows the user to schedule/program an infusion to be delayed for up to 120 minutes or until a specific time up to 23 hours 59 minutes. A Delay Start Callback also allows the user to select an audiovisual callback alert.

There are three types of callbacks:

Before: Callback can be scheduled to occur when the delay is completed and infusion needs to be initiated.

After: Callback can be scheduled to occur when the delayed infusion is complete.

Before and after: Callback can be scheduled to occur when delay is completed and infusion needs to be initiated, and when delayed infusion is complete.

Note: With a delayed start, another infusion is assumed to be running to keep the IV line patent until the delayed infusion begins.

How to program a Delay Start with a Callback:

1. Select Delay Options soft key on Alaris PC unit.
2. Select option for type of delay, and enter in desired value. *(Figure 1)*
3. Prior to pressing Confirm to initiate delay option, press Callback soft key. *(Figure 2)*
4. Select type of callback desired.
5. To initiate delay and callback, press Confirm. *(Figure 3)*

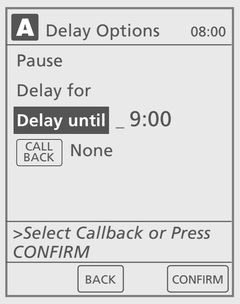


Figure 1

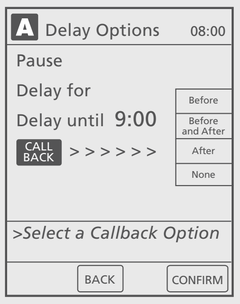


Figure 2

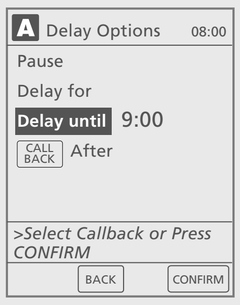


Figure 3

Note: With the Delay Option, KVO reversion is not possible at the end of an infusion. When the delayed infusion completes, the system will not display an audio or visual alert unless a Callback option has been programmed.

System Error troubleshooting

What does System Error mean?

The Alaris PC unit software runs "self-checking" programs prior to and during operation. A **SYSTEM ERROR** message means the device has discovered an error either in the hardware or the software of the Alaris PC unit. All channels will continue to operate and the device will continue to deliver infusions, but the pump will not accept any changes to the rate, dose or VTBI.

What should I do?

Press Silence key, and obtain a new Alaris PC unit. Do not select System Off until the new unit is available. Operation will continue on all channels. Programmed settings on the pump will not be restorable, so current rate, dose and VTBI settings should be noted and recorded prior to powering down the unit. Tag unit, describing the error, and return it to clinical engineering or biomed.

A. The system displays a **SYSTEM ERROR** message on the main display and instruction.

B. Audible alarm tones indicate the system is in an alarm state.

C. Green infusing indicators continue to illuminate. Infusions continue as programmed. Drug name and dose scroll on the module display(s).

D. The **SYSTEM OFF** soft key appears at the bottom right of the display.

Channel Error

What does Channel Error mean?

The Alaris Pump modules run self-checking programs prior to and during operation. A **CHANNEL ERROR** message means the device has discovered an error either in the hardware or software of the affected channel. **OPERATION ON THE AFFECTED CHANNEL WILL STOP, BUT NOT ON THE OTHER INFUSING CHANNELS**.

What should I do?

To silence the alarm and continue operating the unaffected channels, press the **CONFIRM** soft key. Obtain a new pump module. **OPERATION ON THE AFFECTED CHANNEL WILL STOP**. It may be necessary to utilize the Restore function on the unaffected channels that may have been attached and reattached to the Alaris PC unit during the alarm state. Return the affected pump module to biomed.

A. The system displays **CHANNEL ERROR** on the main display and instructions.

B. The flashing red light on the module and audible alarm tones indicate that the unit is in an alarm state. Operation on the affected channel will stop.

C. **CHANNEL ERROR** scrolls on the affected module's display.

D. The **CONFIRM** soft key appears at the bottom left of the main display.

Pump chamber blocked

What is a blocked pump chamber?

A pump chamber blocked alarm indicates the tubing inside the pump is blocked.

Why does it occur?

If the tubing inside the pump is held under fixed compression for a prolonged period of time, on occasion it will fuse closed. The effect is related to the amount of time the tubing spends in a compressed state.

Pump chamber blocked alarms are most likely to occur:

- When primed tubing is loaded into the pump hours before the start of the infusion, with the door left closed.
- When Multi-Dose or Delay Option modes with significant delay periods are used.

What should I do?

1. Close roller clamp, and open door.
2. Remove tubing.
3. Massage tubing from top to bottom to restore flow.
4. Reload set, and close door.
5. Press **NEXT.**
6. Press **CONFIRM.**
7. Open roller clamp, and press **RESTART**.
8. Verify flow in drip chamber after restarting infusion.
9. Change set if not able to establish flow.

Suggestions for prevention:

- Load tubing into pump shortly before start of infusion.
- If tubing has been closed in pump for many hours, tubing should be checked for possible occlusion prior to starting infusion.

Frequently asked questions

Can I infuse blood products through the Alaris Pump module?
Yes, the Alaris System causes no clinically significant hemolysis while infusing red cells or platelets.

Can I use a POWER INJECTOR with the Alaris System tubing?
Our dedicated sets are not designed to withstand pressures above 30 psi. Power injectors may deliver a bolus above 100–300 psi. Always use sets labeled for this use. CareFusion offers selected SmartSite needle-free valves and SmartSite extension sets for use with low-pressure power injectors up to 325 psi and maximum flow rate of 10 mL/second.

Why did I notice a bulge in the pumping segment of the administration set?
IV pushes can cause excessive pressures and balloon the silicone tubing. Clamp off the tubing above the push site, below the pump, to prevent excessive pressure from reaching the pumping chamber.

Can I use the Alaris PC unit and Pump modules in hyperbaric chambers or near magnetic resonance imaging (MRI) or a linear accelerator?
No, the Alaris System is not certified for use in oxygen-enriched environments. The Alaris System is not MRI compatible and cannot be used near MRI, including Stereotaxis technology. CareFusion does, however, offer extra-long extension sets that can be utilized to keep the pump outside the MRI area.

Does the Alaris Pump module have a battery?
No, the Alaris Pump module requires an Alaris PC unit for power and operation.

What kind of battery does the Alaris PC unit have, and what is the battery run time?
The battery type is nickel metal hydride (NiMH). Battery run time is a function of the number of modules attached and module activity. If your facility has enabled the Battery Meter Display feature, the Alaris PC unit will display the remaining battery run time calculated based on the Alaris System's current operating conditions. With a new, fully charged battery, the system will operate as follows before a Battery Discharged message occurs: eight hours with one pump module infusing at 25 mL/hr and four hours with four modules infusing at 25 mL/hr. Battery recharge time: three hours to 90%, six hours to 100% while running.

The battery will have the longest life if the instrument is plugged in and battery use is infrequent. Frequent use of battery power and insufficient battery charge cycles will significantly decrease the life of the battery.

Does the Alaris System alarm for an infiltration?
No, the Alaris Pump module is not designed or intended to detect infiltration.

What are the pressure mode selections with the Alaris Pump module?
There are two pressure modes available to determine the patient-side occlusion limit with the Alaris Pump module:

1. Pump mode, where the downstream occlusion alarm threshold is 525 mmHg at flow rates of 30 mL/hr or greater. For rates less than 30 mL/hr, the occlusion pressure is rate-dependent, to ensure rapid response to occlusions.
2. Selectable Pressure mode, where the downstream occlusion alarm threshold can be adjusted in 25 mmHg increments from 50 mmHg up to the value, set as the profile's maximum occlusion pressure up to a maximum of 525 mmHg. Pressure must reach the hospital-established pressure limit before the occlusion warning will alarm.

How do I change the pressure mode on the Alaris Pump module?

1. Press Channel Select on the channel to be adjusted for pressure limit or pressure mode.
2. Press Options.

How do I adjust the pressure limit on the Alaris Pump module?

1. Press Channel Select on the channel to be adjusted for pressure limit.
2. Press Options. The Pressure Limit Selection screen will display the pressure limit options: Pump and Selectable.
3. Choose the Selectable option. Note: The current pressure limit is listed in mmHg.
   – Press Up or Down.

   Note: With each key press, the pressure limit will increase or decrease in 25 mmHg increments.
4. Once reaching the desired new pressure limit, press Confirm. Notice the change in tick mark on the pressure bar graph on the main display for the channel.

How does the Dynamic Pressure display work, and what exactly is being displayed for the Alaris Pump module?
The Dynamic Pressure Display provides a real-time graphical display of the current patient-side downstream pressure reading and the occlusion alarm threshold. This is useful to see graphically how close the pump is to reaching the occlusion alarm threshold and/or whether the pressure is increasing or decreasing. The Pressure display uses a rectangle bar that extends from the left to the right side of the screen, and in the case of the Alaris Pump module, represents a range of 0–525 mmHg (0-10.2 psi). The bar is filled in up to a point representing the baseline downstream pressure reading at the beginning of an infusion or the current downstream pressure reading during an infusion. A line marker is also shown representing the current occlusion alarm limit. The pressure display information is updated every 10 seconds but is not updated when the instrument is Paused or in Alarm.

On the pressure display, what should I look at to monitor pressure changes in the line for the Alaris Pump module?
To monitor changes in the patient-side pressure, observe the range *(or space)* between the current pressure reading *(filled bar)* and the occlusion alarm limit marker. If this space is getting smaller, the pressure is increasing and vice versa. When the pressure bar reaches the occlusion alarm limit marker, an occlusion alarm will be triggered.

For product support, please contact Customer Advocacy at **888.812.3266** or email **customerfeedback@carefusion.com.**

For technical support, please contact Instrument Technical Support at **888.812.3229.**

For product orders, please contact Customer Order Management at **800.482.4822.**

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